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The WAVES of KOSMOS

By T. B. Edgington, L. L. D.

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PREFACE

The text was the work of the author's leisure hours and was not intended for publication.

The excursions of fancy into the domain of the unknown and the unknowable, which produced the verses, led up to the more serious considerations, which produced the note on Atomic Structures, and resulted in a decision to publish both the text and the note.

The text is submitted for the entertainment of those who favor that kind of literature, but the note is submitted for the serious consideration of those who take an interest in physical science. In order to fully understand the point of view of the author the text and the note must be read and construed together as one instrument.

THE WAVES OF KOSMOS

Light is but a mode of motion;
Wild waves wash a shoreless ocean,
Holding worlds in soft embraces;
Blushes wreathe their upturned faces.

Heat is but a mode of motion;
Moving, in its high promotion,
Heaven above, and earth below,
From heart of fire to crowns of snow.

Color is simply motion's mode;
Causing, along life's rugged road,
Landscapes, verdure, and carnations,
To shed luster by vibrations.

Mind is but a mode of motion;
Sovereign in the world's commotion,
To which all forms of force must yield,
Ranking love, in court, camp, and field.

Matter is a mode of motion;
Stored from energy's vast ocean;
As arch deceiver of mankind,
It flees before the march of mind.

Gravitation is motion's mode;
Its care is ceaselessly bestowed
On circling worlds, suns, systems all;
It gently guides the sparrow's fall.

Consciousness is but motion's mode;
Sparingly on atoms bestowed;
Promoted by their communion,
Their achievements spring from union.

Time and space are but finite modes;
Leading up by converging roads,
From illusive whens, where, and how,
To an eternal here and now.

Time builds his tombs on fleeting waves,
Marking empty and vanished graves,
Of those who heed not nor await
This cruel irony of fate.

Space is accomplice in the crime
Of illusions with remorseless Time;
Juggling with worlds, they dole a span,
To serve all hopes and fears of man.

The elusive fourth dimension
Plays strange tricks with all extension,
Bringing forth in wild confusion
Panoramas of illusion.

Truth, relative, not absolute,
Gives rise to points of view dispute;
Like rainbows on night's black drapery,
Truth shimmers on a sunless sea.

Truth's temple rests on shifting sands,
On subsoil of volcanic lands;
The marble of its cold white halls
Crumbles like falsehood's frescoed walls.

Justice is a mode of motion;
A weak, cranky, judge's notion;
No solid rock bound base is hers,
To shield and save her worshipers.

Hope is but a mode of motion;
Wooing back young love's amotion,
Gilding misfortune's deepest gloom,
Lighting the pathway to the tomb.

Love is but a mode of motion;
True, false, fickle in devotion,
Weaving those complex waves called life,
With beauty's bloom, or hate and strife.

Faith is but a mode of motion;
Lifting up the soul's emotion
Above dark billows here below,
To golden waves which overflow.

In its wide sphere, radiation,
Thrilling all by its vocation,
Is not confined to star strewn domes;
It nurtures love in hearts and homes.

Shining suns and planet ranges
Make their radiance exchanges;
Radiations of a sweet smile
Will, hatred and ill will, beguile.

Electric waves in their great use,
And benefactions they produce,
Given man as God's best guerdon,
Banish time, space, beasts of burden.

Chopped in wave lengths made to order,
Messengers to every border,
The thunderbolts which Jove once hurled,
Now carry news around the world.

Steadfast in their resolution,
Wreathing waves of evolution
Show how fervently they aspire,
To ideals grander, higher.

Ideals which their Architect
Does, through revolving years, expect
To grow in beauty, grandeur, kind,
The cynosure for all mankind.

Evolution, slow, progressive,
Ceaseless, militant, aggressive,
Stops not for passengers or freight;
Its aims are high, its track is straight.

It seeks, for eyes that are human,
Something more lovely than woman;
And, through all its strenuous hours,
Things more beautiful than flowers.

Emanating from one great source,
Motion and its resulting force
Reveal one plan of creation;
All modes serve as illustration.

Vibration, free path, rotation,
Motion's only known vocation,
Compose a cosmic trinity,
Measureless as infinity.

Motion, ether and form, likewise,
Themselves, a trinity comprise;
Combines of these, all things compose,
As all phenomena disclose.

Whence come ethereal stresses;
What force molded in their presses,
Like light uncovers and reveals
Wonders imperfect sense conceals?

Wonders weird of cosmic wild wave,
Which flow from human breasts and lave
The universe's outer wall,
And lay hearts bare to eyes of all;

Unfold my tangled thread of life
From all its convolutions rife;
Show what I have done, hoped for, feared;
Whom I have loved, honored, revered.

Form, with its three-fold dimensions,
Embracing all known extensions,
Perfects a trinity alone,
Omnipresent, all round the throne.

Form makes Niagara's wondrous falls;
Slowly, through wide channels, shores, walls,
The same floods, meandering free,
Wend their sluggish way to the sea.

Substance decays, but form lingers,
Molded by artistic fingers;
Venus sleeps not in marble veins,
But leaps, full grown, from sculptors' brains.

Thought is spray on mind's swept ocean,
Lapsing into flowing motion;
And, like meteors falling through space,
Shines brightly, fitfully, apace.

Thought feeds on material things;
And gathers from a thousand springs
Pabulum for our daily life;
Softens its ills, tempers its strife.

Thought makes the bed on which we lie;
The environs we occupy;
The friends we keep, the friends we lose;
Our unsought paths, and those we choose.

Where do thoughts dwell when they leave us?
Do they perish and bereave us?
Do all their currents cease to flow?
Stagnant, motionless, to and fro?

Thoughts, the public weal commanding,
Thoughts in process of expanding,
Thoughts unbidden, from Pluto's shore,
Which burn into the bosom's core?

Thoughts, flying as new sensations,
Through broad space in swift pulsations;
Thoughts unseen by sign or token,
Breathing hope to hearts once broken?

Thoughts formed like bouquets of roses,
Like ripe fruits in calm reposes,
Like tableaux in their posing room,
Like silver sunset's golden gloom?

Pilgrims, from where bright hearthstones burn,
Kneeling by memory's shadowed urn,
Pray that thoughts of home they cherish,
May not, like the roses, perish.

What becomes of aspirations,
Sanctified by ministrations,
Which gave love, life, a joyous tongue,
When yet both love and life were young?

Are those bright waves still unbroken,
Linked to life's fond hopes unspoken?
Or, drift they aimlessly through space,
Impelled by fate from place to place?

Like the shade of Palinurus,
Until cold day shall immure us,
Halt they on dark Stygian shore,
To rejoin us forever more?

Earth to earth, Kosmos to Kosmos,
By this phrase we name a life's loss;
The gulf between is not so wide,
As they suppose, who never tried.

If a man die, shall he live again?
Queried the most patient of men;
We opine he only changes
To more rhythmic wave swept ranges.

Where light seems slow as snail's paces,
Slowest that run in those races,
Where fleet ones, with very good grace,
Make no note of time nor of space.

Where I'm not my brother's keeper,
Dragging him down deep and deeper;
Where the soul's own undulation
Determines its rank and station.

Where wake fond memories, long forgot;
Time builds no tombs, for Time is not;
Where youth's pure loves throw wide the gates,
In welcome to their grand estates.

Spectral motion pictures, have come;
Some are speaking and some are dumb;
Some talk silly and some talk sense;
All for their herdsman's recompense.

Ghosts of the artificial kind,
By products of an active mind;
They wail, lament, in darkness float,
Like passengers on Charon's boat.

Ghosts, in homes, are not welcome there;
When huddled in a public lair,
We greet them, from whom life has sped,
Chiefly the unforgotten dead.

Knowledge, on ripe age reposing,
Time, its gathered wealth disclosing,
Have brought into one common fold,
All that the ages yet have told.

On crumbling rocks and sands of time,
Of every age, in every clime,
Pictures are formed, statues are cast,
Of life and love, in ages past.

They tell us, in their own sad way,
How years, a thousand, seem a day;
How we are moving through their strife,
To a better and higher life.

When life rolls up as a scroll does,
We see what life as a whole was;
We see age and infancy meet;
Age totters off on childhood's feet.

The strangest is, of all strange things,
That a harp of a thousand strings,
Which vibrate right, but often wrong,
Should, sometimes, keep in tune so long.

Ebbing waves of a life well spent,
For man, home, and good government,
Ripple gently from shore to shore,
As troublous earth fades more and more.

The spirits of the dead past sleep
On the breast of a waveless deep;
Waking, they dance with riotous boom,
Down through our own dark caves of gloom.

Mountains, valleys and streams between,
Are tunnelled, bridged, in forms unseen,
With the fervent, fond emotions
Of true hearts in their devotions.

Hurled rudely against their confines,
Vicious waves have broken outlines;
Good waves in perpetual flow
Are smoothed and burnished as they go.

With thy great store of thunderbolts,
Filled with angry turbulent volts,
Kosmos: thou hast not been profuse,
In man's hands there would be abuse.

Thy good waves which come when I call,
De profundis, swift, great and small,
About me shall hover and twine,
Like halos, round heroes divine.

From earth's rude waves, worn and weary,
From mountains bleak, deserts dreary,
From ocean's storm tossed bosom wild,
Father Kosmos: take home thy child.

Deliver thy child in his fears,
His pain, disappointment, and tears,
From the silence of dark, cold graves,
To thy realm of rhythmical waves.

Where souls build their own prison walls,
And raze them when their impulse calls;
Where horizons expand around,
Unlimited by any bound.

Where beauty's forms, gay, debonair,
Supplant my castles of thin air;
Where rhythm succeeds life's din and roar;
Where love endures for evermore.

Beyond, "where light dwelleth" serene,
Where angels, bashful, cry "unclean;"
And veil their faces with their wings,
Near the white throne and King of kings.

"He giveth His beloved sleep"
Blissful repose for those who weep;
This pledge of rest shall be fulfilled,
When all these wild, proud waves are stilled.

The unattainable and dim,
Chanting a weird, prophetic hymn,
With pomp and circumstance sweeps by,
But leaves me dreaming as I sigh.

Whence come strange visitors in dreams;
What ferryman, across the streams,
Has rowed them from bright realms of light,
To pose as children of the night?

Paths for the pageantry of dreams
Cross rippling cosmic mountain streams,
To shrines, where perfumed censer swings,
Midst a galaxy of white wings.

Gypsy bands of fancies and dreams
Camp on the green banks of these streams,
Foretelling good fortune that waits,
Partition of golden estates.

Phantom ships sail on cosmic meres,
Since first when stars sang in their spheres;
Each is manned by a phantom crew,
Shadows all, shadows they pursue.

Fantastic fleets, well built and tall,
With sails fluttering in breeze and squall,
Glide into ports where shadows play,
And moor to shores as false as they.

Tell Kosmos: where thy bounds are laid;
Where all thy wild, proud waves are stayed;
Reveal their mighty symphony,
The tumult of their harmony.

Give the shibboleth of their clan;
Purport of their message to man;
Mystery of their vibration;
Of their holy excarnation.

We are nurslings of their power;
Victims, too, in the evil hour,
Of their malevolence and schism;
Modulations mere of their rhythm.

The tide beleaguered continents
Constitutes no environments,
Where these mystical waves are stayed;
No bounds in upper air are made.

Lofty is their grand ideal,
Unsubstantial, not unreal,
Kindly stooping, gently bending,
On our hopes and fears attending.

Unlike creatures of time and place,
They sweep through all the realms of space;
Ceaseless in their expansive flight,
Bivouac not for a single night.

Chaos marshals not these great hosts;
All are well drilled, all have their posts;
None, for sleeping on picket line,
Incur imprisonment or fine.

Human ears are too dull to hear
Cadences, rhythmical, and clear,
Soft, falling through the blue profound,
Like snowflakes eddying around.

They hear not thunders fierce or mild,
Of angry waves, unreconciled;
Which shake the vast beleagured spheres,
Conflicts returning through the years.

Kosmos: send waves with rainbow tints;
Which paint out foot and finger prints,
Of crime, sorrow, and fell despair,
And seal complaining lips of care.

Send waves, which cheer all sons of toil;
And fill the widow's cruse with oil;
Rear flowers, longing to be pressed;
And "still the raven's clamorous nest."

Send waves which calm the wintry sea;
And "bid the frozen streams be free;
And wake to music all their fountains;"
Breathe fragrance through vales and mountains.

Ward off waves that bring disaster;
Flock like vultures, swooping faster,
Bringing heartaches, long, drawn-out hours,
Death to fauna, blight to flowers.

Stay those black broods in broad winged flight,
Which seize me in their combined might;
Woes from gloomier world's than this is
Hurl back to their own abysses.

Guard me from mad waves in their flight;
Let them pass me as ships at night;
Save me from their abysmal drift;
Shield me, which ever way they shift.

Give me the sunny side of fate,
Where all thy glad waves culminate;
Where the good stars in my horoscope
Shine still, and wake faith, love and hope.

Where waves are never tempest tossed;
Enthusiasm turns not to frost;
Where truth in triumph rose again,
From error's ruin, wreck and pain.

None can say, with firm reliance,
Superstition is not science;
That the sad heart's prayerful yearning
Does not calm fierce waves returning.

Rather chase wild waves to their lair;
Feel nature's pulses everywhere;
Seek gorgeous fields that may be won,
Than fix dates with Oblivion.

Expectant ages watch and wait,
In hope and faith disconsolate,
On light that shines by gloom's dull ray,
Like phosphorscence round decay.

May my sad soul soon be lifted,
Above clouds, which hope has rifted;
Hope deferred which makes the heart sick,
Up to realms where waves are rhythmic.

Surmounting mundane storms and strife,
Wake to resurrection and life
"Hopes that were angels at their birth,
But died when young, like things of earth."

Aspirations in me burning,
Yearn with an infinite yearning,
For love passing understanding;
All my hopes and fears commanding.

From my soul's self abnegation,
From its prison isolation,
Roll the sepulchral stone away;
Usher in everlasting day.

To my conscious clear beholding,
To my inner self unfolding,
Let light from cycles hence break through,
Luminating my clouded view.

Man's reproachful secrets are hid,
By gloomy caves, mute pyramid;
Thy secrets, through vastness immense,
Are kept open in bold suspense.

In thy twilight comprehending,
Motions that are never ending,
Vibrant, rotate, radiant, changing,
Metamaphoric, rearranging.

So teach us to master thy waves,
Victims of delusions and slaves,
That in wisdom's way we may see,
Something worthy to do and be.

Waves of growth and tides of growing,
From careful or reckless sowing,
In their prime, fruitage, and decay,
Swift or slow, in their several way.

Waves that produce the rose tree's root,
Form tendrils of the vine's young shoot;
Compose their leaves, thorns, fruit, flower,
Agents of an unseen power.

May some luminous way be found
To cross the gulf from light to sound;
To bask in waves which roll between,
In that marvelous world unseen.

Demons of black abysmal night,
Dwell in caverns twixt sound and light;
Realms which lie in the great beyond,
Ope not their gates, give faint respond.

Blaze out a path for a long flight,
From motion's fountain down to light,
Through that undiscovered country,
Whose bourne holds its treasures from me.

Worlds within worlds are reposing,
With fields within fields enclosing;
Built of waves with forms of their own,
Whose fleetest, environ the throne.

Of energy's great fountain scheme,
"No mortal ever dared to dream;"
From which do modes of motion flow,
Transcending all we see or know.

Modes of motion, as grains of sand,
For number on the sea girt strand,
In the same field, peacefully dwell,
Weaving their waves in gentle swell.

Motion reckless, swift in its speed,
Brings disaster, death in its lead;
Takes from calm, devout reflection,
All the true heart's introspection.

Modes of motion, interweaving,
Correlating and retrieving,
All fill me with profoundest awe,
While contemplating motion's law.

Motion immortal as its sire,
Shall not diminish or expire;
Its modes may change, forms dissever,
Steadfast, it rolls on forever.

Proud waves halt not at any shore;
Obstruction only speeds them more;
The hills, cloud topped, rock ribbed and gray,
Are mere play houses for their play.

Every atom dances in glee,
To every other's agency;
Which makes the trembling worlds all kin,
Through universal discipline.

Waves cross waves, without displacing;
Adverse movements, interlacing,
Reach their opposite conclusion,
Without friction or confusion.

Boreal blasts hurl drifting snow
On shivering herds in vales below,
Meeting tornadoes, earthquakes find,
Where tardy trade winds lag behind.

On banks of wild flowers breathing,
Around cottage chimneys wreathing,
Blow aromatic south winds warm;
Harbingers of the thunder storm.

Apple blossoms, sweet violets
Blend their odors with mignonettes;
Honeysuckles, by night and day
Mingle fragrance with new mown hay.

Lightings fitful, in flash and flight,
Lift the black curtains of the night;
Exposing, with thunder's token,
Outlines horrid, landscapes broken.

Rising sunbeams, wakening, write
The epitaph of hideous night;
Gathering shadows, somber, gray,
Attend the obsequies of day.

Sunrise, eternal, progressive,
With its bird chorus successive,
Halts not for love of the sweet song;
Nor to stay disaster or wrong.

The sun weaves shades for starlit domes;
Lays waste the thunder's cloudbuilt homes;
Night's black skirts with fringe adorning;
Gilding snowclad isles of morning.

He keeps in play all the fountains;
Kidnaps rivers back to mountains;
Turns mill wheels for the sons of toil;
Makes sea waves dance, break and recoil.

Over the prairie's vast expanse,
Silent shadows of clouds advance;
Islands of shade in seas of sun,
Flocking, or floating, one by one.

Over the sea of life's expanse,
Dark shadows float as if by chance;
Here they cluster, there they languish,
Till the air is filled with anguish.

Northern lights glow with grimaces,
At mountains and all high places;
Zodiac fringes gild sunset's gloom,
And give dawn a roseate plume.

In time's great womb, throbbing, sleeping,
In creation's watch and keeping,
Lie nebulae, yearning in vain,
To be joyous new worlds again.

Earth and sea make their exchanges;
The sea weeps on mountain ranges;
Lashes coasts with its tides in glee;
While earth loans its streams to the sea.

Whole rivers, and their crystal creeks,
Are hurled against the mountain peaks;
They, thus from cloudland once set free,
Again wend their way to the sea.

Tints from Aurora's saffron bed,
Are bartered for earth's radiance shed;
Custom tax is not inflicted,
Corners, trusts, are interdicted.

Commerce of earth with Kosmos seems,
Free as the trade of clouds with streams;
Messages, with swift earthward speed,
Come in cipher we cannot read.

Unfolding depths from star to star,
On huge hinges there stands ajar,
Where, in awe, I ponder and sit,
The landscape door of the Infinite.

Far from my gloomy donjon keep,
I hear deep calling unto deep;
While with tumultuous uproar,
Abysses answer and encore.

Music soft, from vast expanses,
Floats and swells, recedes, advances,
Thrilling my soul with dreams again,
Of peace on earth, good will to men.

Striking one of the higher notes,
Which nature's gamut thus denotes,
God said in majesty and might,
"Let there be light and there was light."

Inspired by the heavenly hosts,
Tides break on continents and coasts;
Billows, unseen, lash Mikros beach,
Too tiny to portray in speech.

Moon stricken tides perturb the sea,
At spring tide flood and perigee;
Maddening waves, from the Southern Cross,
Caused shooting of the albatross.

Sinking ships call to ships at sea;
Friendly pulsations, all agree,
Through fog, icebergs and starless night,
To come at once and save with might.

Proud navies, riding on the seas,
Destroyed by occult agencies,
Are blown into the convulsed air,
Scattered fragments float everywhere.

Waves, which bear wealth upon their crest,
Subside when some men are in quest;
Some get fortune, some get a fall;
Time and chance happen to them all.

Men, in vain, sought the holy grail,
On mountain meres, and valley trail;
Some digged hills, that were bare and old,
In fruitless search for hidden gold.

Morning trains dump their human freight,
On crowded streets with hopes elate,
Who see their fortunes end in smoke;
Their house has failed, the bank is broke.

The poor man, always can command
Resources, which uplift, expand;
The rich man's heritage congeals,
The ardor which the poor man feels.

Mind vibrations, measured, classed,
Emotions, however, amassed,
Are public wealth, not private store;
Deep heart secrets they now explore.

Little warriors, in life's red flood,
Bravely, wage war, for sane pure blood;
Fierce invaders they are smiting
For life and love they are fighting.

Long after the battle, mother,
I am thinking of another,
Who fell in this unequal strife,
In the morning of her dear life.

Storms rage in diamonds in the ring,
More fateful in their sweep and swing,
Than earthquakes shaking isle and main,
Tornadoes sweeping sea and plain.

The songs, which the mocking birds sing,
Float on the first flushes of spring;
Iris of doves, lapwing's new crests,
Come on waves which roll round their nests.

Hopes rising, tides flow everywhere;
They have their ebb tide of despair;
We're in the vortex of their sweep;
Rocked in the cradle of their deep.

Streams of civic inspiration,
To undo or save a nation,
In their destructive overflow,
Fill all lands with wailing and woe.

The face of Europe has been marred;
By trenches, craters has been scarred;
The divine right to govern wrong,
In freedom's home, could last long.

What tyrant's hand, or prince's breath
Should hold issues of life or death,
Of millions, husbands, fathers, sons,
Homeless want for dependent ones?

Minions of force may form in ranks,
From mountain tops to river banks;
Battle flags all may be unfurled:
Sane minds will rouse, and rule the world.

Plow shares which carve out the furrow,
Where worms, snakes, and lizards burrow,
Will cleave through bones in all the leas,
And upturn skulls for centuries.

Envoys from Valhalla's high dome,
Through smoke and clouds to their long home,
Bear spirits of heroes who fell,
In waving lines of battle's hell.

Souls of uncounted thousands slain,
Whose bodies lie on hill and plain,
Halt for comrades from land and sea,
Who soon shall join their company.

Bivouacking on the rainbow's arch,
The grand army resumes its march,
From sunken ships, filthy trenches,
Poison gases, shocking stenches.

Valkyrs with swift airplanes collide;
Their proud steeds stem the phantom tide;
And carry, from the crimson fields,
The bravest ever borne on shields.

Waves of unrest and disorder,
Sweep through homes to every border;
Chaos, from manse to cavern den,
Finds refuge in the haunts of men.

Pity waves for shipwrecked brothers
Buffet waves of hate from others,
Clashing fiercely in open field,
Where these may conquer, those may yield.

Waves of revenge, and fell despair,
With kindred hosts, from every lair,
Breaking through love's last defenses
Ruin all that love dispenses.

From homes, and founts of fervent prayer,
And loving hearts assembled there,
Bright waves are flowing and breaking,
Round absent hearts that are aching.

Tides that roll from a blushing rose,
Floods from a mind that ebbs and flows,
Surf from the storm swept sounding sea,
Mingling, dash in spray around me.

Radiant as the sun that shines,
Man's field, in Nature's broad outlines,
Reaches far outward, and apace,
Like stars in jewelled domes of space.

All human hearts, that are beating,
And all starry hosts send greeting
Mingled waves to the voiceless void,
To be transformed, but not destroyed.

They glide through, in their wild career,
Measureless depths, from sphere to sphere;
Babbling bridges, which span the sea,
Hearts of millions, now, and to be.

Untold by shock or seismograph,
Or painted form, or photograph,
Lofty mountain peaks they dispense,
Majestic for their reticence.

Milky Way vistas, broad of veldt,
Sweet Pleiades, Orion's belt,
Channels are for their ceaseless flow,
Round through earth's surging undertow.

Wildly as these waves commingle,
They toss no shells to their shingle;
No wreckage, no bodies of dead;
Bright golden shores bound them instead.

Take all the great world's happenings;
Sift them well through our own heart strings;
Nothing but waves they are at best,
With no surcease, no place for rest.

Nothing but waves! Nothing but waves!
My tide beleagured spirit craves,
Unknown in all this throbbing round,
Some spot where perfect rest is found.

Sing them, Kosmos: their last refrain;
Bring repose to thy vast domain;
Give immensity, eternity
Their everlasting lullaby.

Tell me, giving ranks and stations,
Imports all of thy vibrations;
Grandly elucidate all these,
By roll calls of their centuries.

Call each one by its own great name,
Group love, omniscience, beauty, fame;
Name those which, from the beginning,
Have kept all the wide worlds spinning.

Classify waves, and their allies,
Which friendships form, and family ties;
Bind circling planets to their sun;
Guide vagrant comets, one by one.

Publish in cloudless light of day,
Atoms secrets to Milky Way;
Widen our expanding vision,
From rude forms to fields Elysian.

Throw off from knowledge, all the bars;
Tell us the message of the stars;
The inner life of the mountains;
The fairy tales of the fountains.

What means old ocean's endless moan;
The howling wind's hoarse undertone;
What the lessons taught by sorrow,
From ills we have, griefs we borrow.

What the message of the flowers;
Blooming singly or in bowers,
With their yearly repetitions,
Season's changes and fruitions.

Where are music's high born sources;
Where its avenues and courses,
To the heart that it soothes and thrills,
To inspirations it instills.

Say, Kosmos: this auspicious hour,
Where's thy Master's throne of power?
Echoes loud and low, here and there,
Answer, everywhere, everywhere.

Atomic structures inspire awe,
Like the great periodic law;
Where, in deep and dark recesses,
Atoms march in solemn presses.

Looking up, on a grander scale,
When stars are bright, and moon is pale,
We see a like great law, in force,
Rule suns and worlds, in their swift course.

Contemplating all these and more,
What man may do, has done before,
We find a single purpose runs
Through trackless space, and countless suns.

With scant freedom, man's purpose still
Bends these waves to his own sweet will,
Mind is sovereign, mind is the state;
The sum of all these waves is fate.

Bombarded by the human mind,
Waves are transformed in force and kind;
Swayed by mental operations,
They conform to new relations.

Ceaseless, in some high endeavor,
All these waves flow on forever;
All things else exist in seeming,
Phantoms mere, of dreams in dreaming.

To know, I am daily praying,
What all these wild waves are saying;
We may hear them, in future years,
Join in the anthems of the spheres.

Groping from darkness unto light,
Through a long and perilous night,
We seek waves that are uplifting,
Which show whither we are drifting.

Serfs of an autocratic state,
Whose decrees of exile we wait,
We are eager to hear and see,
The outcome of their prophecy.

ATOMIC STRUCTURES

The original conception of the atom was that it was a single thing which could not be created, impaired or annihilated. This view of the atom is shown to be incorrect since the discovery of radium by M. and Mme. Curie of Paris in the year 1902. The radium atom is probably a product of the disintegration of uranium. The atoms of other elements have their processes of disintegration into other substances classed as elements. According to recent discoveries the atom is to be conceived of, not as an ultimate particle, but as a complex system, whose components of corpuscles or electrons are in rapid orbital motion.

Spectrum analysis has established the fact that atoms and molecules are in a state of constant vibration at all temperatures. The cause of these vibrations has been a subject of speculation and controversy. The hypothesis, discussed in this paper, maintains that the vibrations constitute a part of the structure of every atom, and that every atom has two antagonistic and irreconcilable motions. One motion is the vortex ring motion of the corpuscles or electrons, and the other is the vibratory motion of the larger mass of the atom, which is composed of corpuscles or electrons, whose translational motions have become, permanently, transformed into vibratory motions.

Sir J. J. Thomson says "The corpuscles are negatively electrified bodies, all of which are of exact-

ly the same kind, each carries the same quantity of electricity and each has the same mass."

One part of the atom according to Thompson is made up of these negatively electrified corpuscles and the other part is made up of a larger mass which is positively electrified. This complicated system of negatively and positively electrified bodies constitutes the atom. According to Thomson the number of corpuscles in each atom is about half the atomic weight, except hydrogen which probably has but one corpuscle. Oxygen, whose atomic weight is sixteen, has eight corpuscles, and so on.

Thomson is inclined to take the view of Prout that the atoms of the different elements are all aggregations of hydrogen atoms. In his article entitled "Positive Electricity" he has made a tabulated statement of the atomic weight of certain elements which strongly supports this view.

Thomson says; "Each kind of atom produces a definite and distinct parabola on the photographic plate, and by measuring the parabola we can determine the mass of the atom which produces it." He assumes that all the forces inside of the atom are electrical, "and that the electrical forces between the small charges in the atom separated by infinitesimal atomic distances follow exactly the same laws as those we know to be followed, when the distances between the charged bodies are millions of times the atomic distances and the quan-

tity of electricity millions of times the atomic charges."

Thomson in his article entitled "Positive Electricity" does not present any theories or views in respect to the manner in which the larger, positively electrified mass of the atom aggregated nor does he advance any views concerning the manner in which this larger mass became positively electrified.

Experiments with vortex rings, which have been produced artificially have established the following facts in respect to their behavior.

1. The ring moves forward in a direction perpendicular to the plane of the ring.

2. It possesses momentum and will push against the object it strikes.

3. If made to move rapidly adjacent to a surface like a wall or table, it will move towards it as if attracted by it.

4. A light body like a feather will be, apparently, pushed out of the way in front of it, and drawn towards it if behind it.

5. If two such rings bump together at their edges each will vibrate with well marked nodes and loops, showing that, as rings, they are elastic bodies.

Vortex rings, for the purposes of experiment, may be produced from the fumes of ammonia and hydrochloric acid, with as much facility as soap bubbles, from soap and water, but the instrument for their production is different. Exper-

iments thus conducted, with these fragile rings, are important as showing their probable behavior, when the rings are not easily destroyed, and where the field of their action is frictionless.

The contention here is that the corpuscles or electrons are vortex rings, and that the larger positively electrified mass of the atom is made up of aggregations of these corpuscles which have lost their translational momentum. The effort here is to take up the atom where Thomson left off. He gave us the negatively electrified corpuscle and the positively electrified mass of the atom.

The vortex rings, when they aggregate into the larger, positively electrified mass, lose their free path or translational motion. When these aggregations are once formed there is a transformation of the motion in part which the original corpuscles possessed. The free path motion of the several corpuscles, as vortex rings, becomes transformed into some other kind of motion.

If it is conceded that corpuscles are vortex rings, the aggregation of them into the larger mass of the atom appears to be a simple process. Since these corpuscles are all of the same size, if two of them, moving in opposite directions on the same plane, would meet and collide, their translational movement would cease and the inertia of the two corpuscles would result. Such a nucleus would result in numerous and sundry aggregations to form the larger masses of each and all of the atoms from

hydrogen which has the least atomic weight, on up to uranium which has the greatest atomic weight of all known elements.

Since the translational motion of these masses has been destroyed, their momentum or the force which produced it remains. The result therefore is that this translational motion of the corpuscles has been transformed into some other form of motion. The form of motion which any stationary mass possesses as a whole we readily conceive to be a rotary motion. The motion, however, that is produced by the impact or collision of two bodies is a vibratory one. We know, too, that atoms vibrate at all temperatures. If this vibration of this larger mass of the atom was caused by the original impact of the corpuscles it would cease, ordinarily, in course of time, but as the translational motion of the corpuscles has been transformed, it, doubtless, is transformed into sustaining and perpetuating the vibratory motion. This vibratory mass may be caused to rotate as the result of the reaction of its vibrations upon its environment. It is not necessary to support our hypothesis that this larger mass of the atom should revolve upon an axis at all. All the conditions of attraction that we are seeking to confer upon this larger mass of the atom may be conferred upon it by its vibrations. A vibrating mass attracts bodies close to it. When light bodies are brought near to a vibrating body like a tuning

fork, they are attracted by it so long as the vibrations continue.

Vibration is an inherent quality of the atom and it is not caused originally by some mysterious power external to it. The rotary motion of the larger mass of the atom, if there is any such motion, may be one of the results of the transformation of the translational motion of the corpuscles as before stated, or it may result from the reaction of these vibrations upon their environment. The opinion is here expressed that the larger mass of the atom does, in fact, rotate upon its axis, and that the attraction of the retinue of corpuscles around it is produced by the combined attractive force of these vibrations and rotation.

The hydrogen atom, as before stated, is the smallest of all the atoms. Dr. Prout adopted the view that all the larger atoms are mere aggregations of the hydrogen atom. The radio activity of certain elements, to which radium and helium belong, tends to militate, in some degree, against Prout's hypothesis. This difference, however, may result from the different modes in which the hydrogen atoms aggregate into the larger ones.

The collision of two or more corpuscles, as stated, resulting in their inertia and in the transformation of their translational motion into a vibratory motion, is only one of a number of modes in which the larger masses of the atom may aggregate. Two or more corpuscles or a larger number of them

may, possibly, be thrown against a nonconducting surface in such a manner and under such conditions as will produce the inertia of this entire aggregation of corpuscles and convert their translational motion into a vibratory one. The impact produces the vibrations and the simultaneous arrest of the translational motion, perpetuates the vibrations, which action becomes converted permanently into vibrations.

Sir J. J. Thomson, in his article in the Harper's Magazine of September 1914, states that the nmber of corpuscles in each atom constitutes about half of its atomic weight. He refers to the corpuscles which have an orbital motion around the larger mass of the atom.

According to the Mendelefian classification, uranium, which has 238.5 units in its atom, is the largest atom so far as is yet known. Uranium in the course of time disintegrates into radium, which has an atomic weight of 226.4. Between the hydrogen and the uranium atoms there are at least 79 other atoms of different sizes the larger masses of which are attended with separate corpuscles of about half their respective atomic weights.

Certain corollaries are to be drawn from this constitution of the atom.

One inference is that the force, which attracts this retinue of corpuscles around this mass, is produced by the attraction resulting from the vibra-

tions of this larger mass of the atom, and by the rotation of this larger mass, if in fact it rotates.

Another inference is, that the larger the mass is, the greater is its attractive force, and that this attractive force controls masses, which, in the aggregate, are about equal to one half of the entire mass of the atom. This larger mass of the atom spontaneously brings into its retinue from space a number of corpuscles about equal to its own mass.

Another inference it that the vibrations, and possible rotation of this larger mass furnish the principal, if not the exclusive force, whereby its retinue of corpuscles is gathered and put in motion around it.

The inference, also, is that the capacity of this larger mass to command such retinue is in proportion to its mass and that its capacity to command these corpuscles is exhausted when their number exceeds the atomic weight of the larger mass of each atom.

If it is true, that this larger mass of each respective atom, is made up of corpuscles which have aggregated in the manner stated in the preceding part of this paper, then it seems to follow that the attractive force of any mass composed of atoms is measured by the aggregate amount of the vibrations of the several atoms which constitute it.

These considerations lead to the presumption that the aggregate amount of the vibrations of the atoms which compose the sun, planets, and other

like bodies is the principal if not the only force which they possess, which has taken the name of solar and planetary attraction. The rotation of the attracting body may account for part of its attractive force. Vibration and rotation combined constitute an attractive force of great power.

There are other corollaries to the proposition that the larger mass of the atom is composed of two or more corpuscles, which have collided as stated, which has resulted in the inertia of this mass, and the conversion of the translational motion of the respective corpuscles into a vibratory motion. Heat is one of the products of a collision of masses, great or small. The degree of heat is measured by the amplitude of the vibrations. These atomic vibrations represent a certain amount of heat. In proportion as the vibratory force of the atom is increased, so that when we get up to the radium atom, which possesses an atomic weight of 226.4, we find a much higher temperature than can be found in any of the atoms of less atomic weight. Each atom according to its size is so constituted that it possesses a certain amount of inherent heat, which is capable of being increased by external causes.

The collision of the corpuscles, which resulted in the formation of the larger mass of the atom, caused the vibrations. These vibrations, thus produced, are heat vibrations, and they constitute the inherent heat of the atom, and these heat vibrations are capable of amplification from adventitious causes.

It has been attempted to be shown that the larger the atom the greater is its attractive force. In like manner, it would appear that the larger the atom the greater amount of heat it contains. So far as experiments have been made, it appears to be true, that the larger atoms do contain a greater amount of heat than the smaller ones. "In 1903 it was shown by Curie and Laborde that a radium compound was always hotter than the surrounding medium." "Curie and Laborde found that the temperature of a radium salt is always a degree or two above that of the surrounding atmosphere."

The moon is considered to be the smallest and the coldest of the heavenly bodies that we possess any definite knowledge of; and Mars, which is a smaller planet than the earth, is ascertained to be much colder; and Jupiter, which is much larger than the earth, is much warmer as shown from its belts of molten matter; and the sun, which is the largest body in our planetary system, is the hottest of all.

The sun is a hotter body than the planet Mars for the same reason that the radium atom is a hotter body than the hydrogen atom. It is larger and contains a greater amount of vibrating force and activity. The sun's heat is inherent and structural in the atoms, which compose it, and it is not dependent upon the results of the contractions of the sun's mass as the source of its heat supply. This view relieves the sun's heat of some of its mystery

and the minds of men of many misgivings concerning is probable duration.

The solar system is constructed upon the same general plan as the atom. The planets and asteroids revolve around the sun in the same manner and in obedience to the same forces, which cause the corpuscles to revolve around the larger mass of the atom. These bodies which revolve around the sun have, doubtless, been simply attracted from space, automatically, in the same manner that the corpuscles have been brought into revolution around the larger mass of the atom. The vibratory and rotary attraction of the sun must be a factor of immense power controlling the revolutions of the planets around it. The mean distance of the moon from the earth is 238,818 miles. The diameter of the sun is over 3.6 times the distance of the moon from the earth. If the sun, like the large mass of the atom, has the power to attract bodies which have an aggregate mass, equal to its mass, it will be seen by a comparison of the masses of all the known planets and satellites with the sun, that the capacity of the sun to attract still other plantary bodies has not been exhausted.

In order to account for the heat of the sun, physicists have adopted the theory that the heat resulted from the constant and gradual contraction of the sun's mass. There is no evidence to support this view. The excessive heat of radium refutes it. It is at variance with the law of evolution, which

teaches that the sun, during the aeons to come, will become a more glorious and effulgent body; and that the planets will attain to still greater beauty, grandeur and magnificence. The condition is one of evolution, and not decadence. The contraction theory is debasing in its pessimism.

Sir J. J. Thomson has pointed out as before stated, that the atom is composed of negatively electrified corpuscles, and a larger mass, which is positively electrified. The effort is made, in this paper to show that the corpuscles are vortex rings, the vortex motion of which is repellent. The effort, also, is to show that the larger mass of the atom possesses a vibratory motion, which has certain attractive qualities. These considerations lead up to the conclusion that the vortex motion of the corpuscles constitutes the basic principle of negative electricity. These two adversary forces seem to constitute the rudiments of electricity.

When these inherent thermal waves attain various amplitudes they are called degrees of temperatures. Each atom of the several elements has a different vibration. Moreover it has been stated on high authority that each atom has several vibrations like piano strings, musical instruments, and bells. These vibrations generate waves in the ether of a very complex character.

All the atoms have some temperature, which was generated in the larger mass of the atom at the time this larger mass was originally formed, as

heretofore pointed out in this essay. The lowest temperature, in the smallest atoms or molecules, is considerably above absolute zero. The temperature of an atom can never be reduced to absolute zero because temperature is one of the component parts of its structure.

Certain other corollaries are to be drawn from the constitution of the corpuscle and the atom.

It has been shown how the corpuscles, which are assumed to be vortex rings, would cease to move through space by colliding and thereby lose their translational motion, which becomes a vibratory motion, when the corpuscles have been brought to a condition of inertia.

When atoms and molecules unite into larger masses, the same conditions which produced inertia in the atoms and molecules will produce inertia in the larger masses of matter. The atoms, which are in a state of constant vibration at all temperatures, become bound together into bars of iron, and blocks of granite and marble, by the same agency which caused the corpuscles to unite into the larger and inert mass of the atom. Thus we find that inertia, which is the negation of motion, is itself a mere mode of motion.

Sir J. J. Thomson in his essay on "Positive Electricity" has said that "Negative electrification has been shown to be due to the presence of minute particles called corpuscles or electrons, all of which are exactly of the same kind—that is each particle

carries the same mass." These electrons or corpuscles fill all space and as they constitute the entire masses of all material things, it confers upon the Universe some of the qualities of a solid body, or of a unit with different degrees of solidity in some of its parts. The great body of this unit is called space, which is filled with corpuscles or electrons; and yet we would not be justified in affirming that they alone constitute the ether of space. If however, these corpuscles or electrons, are vortex rings there is some basis for the assumption that the quantity of negative electricity which they carry consists of nothing more than their vortex motions and the results of such motion. There is some basis for the assumption that the positive electricity found in the larger mass of the atom consists of nothing more than its vibrations, and possibly its rotations and the effects of these motions. Electricity consists of two incompatible modes of motion.

The dwelling place of negative electricity is illimitable space. The birth places of positive electricity are among the atoms and molecules. The antagonism of these two forces creates a tremendous power. These two adversary forces seem to constitute the rudiments of electricity, if not electricity itself. Negative and positive electricity are modes of motion.

This quasi solidity of the entire Universe, and the extreme sensitiveness of the corpuscles of space

to stresses, which have their origin in material causes, seem to furnish an explanation of the fact that every atom in the Universe exerts an influence upon every other atom.

The corollaries to the proposition that the corpuscles or electrons are vortex rings do not stop here. It has been shown that the vortex ring moves through space of its own inherent force in a direction perpendicular to the plane of the ring; and that it possesses linear momentum, and will push against the object it comes in contact with. When the free corpuscles of space, therefore come in contact with the surface of the earth they would push towards it. This push of the corpuscles towards the earth would naturally take place for some distance above the earth. It is assumed that this push or momentum of the corpuscles would take place for some considerable distance above the surface of the earth to that periphery above the earth which bounds the limit where bodies will fall to the earth instead of the sun. There would be, therefore, a constantly propelling force throughout this entire perisphere which would tend to drive bodies in it towards the earth.

This force is cumulative and continuous, as the falling body leaves a high position above the earth and falls to the surface. The vibrations of the earth and its rotation upon its axis are attractive forces in the field of universal gravitation, but they are considered to be inadequate to account for the en-

tire phenomena of terrestial gravitation. Like other phenomena gravitation is a mode of motion.

Referring again to that portion of space, which is bounded on one side by the surface of the earth; and on the other side by that periphery, which bounds the limits where bodies would fall to the earth instead of the sun, there are still other considerations which command attention. This periphery bounds the empire of terrestrial gravitation in which all the corpuscles are faced toward the earth and are directing their translational momentum toward the earth. The earth and this perisphere constitute a terrestial system of immense magnitude, which is distinct from the solar and planetary system. This immense terrestial system becomes a repellent force to the attractive forces which operate upon the outer boundary of this perisphere. The result of these actions and reactions together with the earth's rotation must inevitably cause the perisphere to rotate upon an axis.

The rotation, of this perisphere on its axis, may, possibly, account for certain phenomena such as the variations of the magnetic needle. Some undiscovered agency has given to terrestial magnetism a polarity, which does not coincide with the earth's polarity by several degrees. The variations of the magnetic needle indicate that the body which rotates on this magnetic axis, occupies several years in making a single revolution.

From these considerations, the corpuscles appear

to be the original source of energy; and, when corpuscles continue to form atoms and molecules, motion undergoes many transformations without any loss of energy. The Universe seems to be made up of the corpuscles or electrons, and the several forms of their combinations and motions. The existence of that impalpable entity called ether is a mere hypothesis, based upon the preconceived idea that there could be no motion unless there is something of a substantive quality to be moved. However this may be, this hypothetical entity is not what we call matter. The conclusion from the premises under discussion is that matter is a mode of motion.

In the year 1847 Helmholtz read a paper before a Berlin audience maintaining the proposition since known as the conservation of energy. In the light of more recent discoveries this phrase should become obsolete for the more appropriate expression, the conservation of motion. The cause which gave the corpuscle its peculiar motions is unknown, but the transformations, which this corpuscular motion, undergoes, appear to be traceable.

Hemholtz, on another occasion, after an investigation of the properties of vortical motions, pointed out that if a vortical motion was set up in a frictionless medium, the motion would be permanent; and, that it could not be transformed. It is, here, assumed that the vortical motion of the corpuscles, in space, is not transformable, and that it does not become transformed in consequence of

the arrest and cessation of its translational motion and its conversion, permanently, into vibrations.

Motion, in its activities, is boundless. All the various and concrete forms of inertia, all the manifestations and diversities of animal life, all the multiform and variegated growths of the vegetable kingdom, and all the displays of phenomena are but the modulations of its rhythm. The atom is the little strong box in which Nature's momentous secrets have been kept. M. and Mme. Curie in the year 1902 opened this box and the struggle of physicists, ever since, has had for its object, the examination and appropriation of its contents.

What has been stated in this essay is not to be considered as discoveries in physical science. It is based upon a mere hypothesis, which may become a good working hypothesis in consequence of the great number of phenomena which it explains and elucidates. The great multiplicity of phenomena which the hypothesis does in fact elucidate, is relied upon to commend it to favorable consideration, as a unifying conception of apparently independent and unrelated phenomena.

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